SIMTEK6327

IN THE UNITED STATES PATENT OFFICE

In re Application of
Tatsuya Anma

App. No.: 10/063148
Filed: March 26, 2002
Conf. No.: 2722
Title: ROTOR FOR A PERMANENT MAGNET TYPE GENERATOR
Examiner: H. Nguyen
Art Unit: 2834

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January 23, 2004
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Commissioner for Patents
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APPELLANT'S BRIEF

RELATED APPEALS AND INTERFERENCES

There are no other Appeals or Interferences, that have a bearing on or which would be affected by the decision in this Appeal.

REAL PARTY IN INTEREST

In addition to the appellant, the real party in interest is his assignee, Kabushiki Kaisha Moric, a Japanese company.

STATUS OF THE CLAIMS

Claims 1 through 8 and 11 remain in this application.

Claims 5, 6 and 11 have been indicated as allowable subject to their being rewritten in independent form.

Therefore claims 1 through 4, 7 and 8 are before the Board on Appeal. A clean copy of these claims appears in the appendix to this Brief.

STATUS OF AMENDMENTS

A proposed amendment was filed in response to the Final Rejection, but was denied entry because the Examiner believed that the proposed amendment to claim 1 calling for the "cylindrical portion" to extend "axially" constituted "a new issue that require further search and consideration." Applicant's attorney would normally not make reference to the Examiner's statement, but in this case and as will be argued later, it is helpful in understanding the way the Examiner is reading and acting on the claims before the Board.

This amendment has not been reflected in the Appendix and the claims before the Board are as finally rejected.

APPELLANT'S INVENTION

Appellant's invention relates to a light weight, extremely strong rotor for a rotating electrical machine such as a motor or generator that carries the permanent magnets that cooperate with electrical coils that are wound around the pole teeth of a related stator. If the machine is a motor, the coil windings are sequentially energized to effect rotation of the rotor. If the machine is a generator, the rotor is driven by a prime mover to generate an electrical current in the coil windings.

In either case heat is generated and the rotor is formed with fin like openings to not only reduce weight but also to dissipate heat.

The disclosed embodiments are described in full detail by reference to the accompanying drawings under the appropriate heading in the specification.

ISSUE BEFORE THE BOARD

The issue before the Board is whether the Examiner has made out a prima facia case of anticipation under 35 USC 102 of the rejected claims by Kanayama 4,510,409 (Kanayama).

GROUPING OF THE CLAIMS

Claims 1 through 3 stand or fall together. The patentability of this group and claims 5, 7 and 8 will be argued separately.

APPELLANT'S ARGUMENTS

Although it is admitted that the Kanayama reference and applicant's invention have one common goal (cooling an electrical machine) they relate to totally different machine configurations and achieve this result by different structures. Also the Kanayama reference does not deal with the strength and light weight requirements solved by the claimed construction.

At the outset appellant would like to explain the considerable differences ion the basic structure of the two types of machines. Kanayama discloses what he refers to as a "flat electric machine" (see column 1 lines 9, 12, 18 etc). This is a type of machine where the permanent magnets are affixed to radially extending surfaces of what amounts to a flat, round plate. Appellant is dealing with a type of machine where the magnets are secured to a cylindrical surface of an element that is fixed by means of a disk shaped portion to a hub for receiving a shaft. These differences are apparent from a comparison of appellant's FIG. 1 and the like numbered figure of the reference.

Because of this difference there is a significant difference in the weight of the rotating elements in addition to their common cooling problem. Appellant solves both problems with the same structure. Kanayama does nothing to significantly reduce weight and teaches nothing as to how to achieve a result with the very specific type of machine claimed by appellant.

Thus it now appears relevant to address the exact claim language, something that the Examiner has avoided. Claim 1 is reproduced below with the distinguishing language underlined.

1. A rotor for a rotating electrical machine comprised of a cylindrical portion carrying a plurality of spaced permanent magnets, a hub portion adapted to be affixed to a rotatable shaft, an interconnecting disk shaped portion for interconnecting said cylindrical portion and said hub portions, and a plurality of cooling openings formed in said interconnecting disk shaped portion, said cooling openings being defined by inclined leading edges in the direction of rotation of said rotor for promoting a cooling flow axially through said interconnecting disk shaped portion.

It is important to note that Kanayama, because of the difference in the type of machine he is dealing with and the considerably different magnet mounting arrangement requires two sets of holes to achieve his air flow, A first series of holes 17 admit the air to the area where the magnets are located and a second series of holes 19a are required to extract the air. These latter holes are formed in the same surface on which the magnets are mounted and between the individual magnets. Also he must provide scoops 17a to establish the air flow. These are not required by appellant as the shape of the holes is sufficient to create the air flow.

Although in retrospect it might appear that the reference teaches the invention, that is not the ground of rejection before the Board. Furthermore it is submitted that such a conclusion is based on hindsight reasoning, particularly bearing in mind the totally different type of machines involved. Appellant is not dealing with a flat type of machine where the magnets are mounted on a radially extending face. Appellant is concerned with a machine where the magnets are mounted on a cylindrical surface that is connected to a hub by a disk shaped portion in which the sole cooling openings are formed.

Apparently the Examiner does not understand the meaning of "cylindrical". This is why his comment regarding the insertion of the words "axially extending" was a new issue in his mind. He apparently ever even searched for a real anticipation of the claim language, but rested on a reference that showed cooling holes, regardless of where they were formed. Appellant does not assert that he invented cooling holes. He did, however, invent their use in the specific structure and location in the underlined portions of the claim emphasized above.

As noted above, claims 2 and 3 stand or fall with claim1.

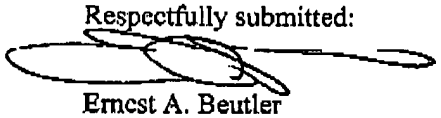
Claim 4 depends on claim 1 and further defines over Kanayama in calling for the disk shaped portion in which the holes are formed to be extend "radially inwardly from the cylindrical portion at one side thereof". This is not true in the reference since it totally lacks the cylindrical portion.

Claims 7 and 8 further distinguish over the reference in calling for "the cooling openings occupy the major portion of the interconnecting disk shaped portion so that the remaining areas of said interconnecting disk shaped portion comprise spokes". Figures 11 and 12 of the reference clearly show no spokes.

Claim 8 adds the further limitation that the spokes are formed so that "one axial side of the spokes is inclined from one side thereof to the other side".

In summary it is most respectfully submitted that the Examiner has not made out a prima facia case of anticipation, particularly in the nature of the claimed machine, but merely has established what is admittedly old generally that cooling holes were known at the time of appellants invention. However no one had thought of how to use them in the type of machine claimed in a manner to reduce weight and effect cooling. The elegant simplicity of the invention should emphasize its patentability not the opposite. A reversal of the rejection is therefore respectfully requested.

Respectfully submitted:



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APPENDIX CLEAN COPY OF CLAIMS ON APPEAL

1. A rotor for a rotating electrical machine comprised of a cylindrical portion carrying a plurality of spaced permanent magnets, a hub portion adapted to be affixed to a rotatable shaft, an interconnecting disk shaped portion for interconnecting said cylindrical portion and said hub portions, and a plurality of cooling openings formed in said interconnecting disk shaped portion, said cooling openings being defined by inclined leading edges in the direction of rotation of said rotor for promoting a cooling flow axially through said interconnecting disk shaped portion.

2. A rotor for a rotating electrical machine as set forth in claim 1, wherein the cylindrical portion and the interconnecting disk shaped portion are integral with each other.

3. A rotor for a rotating electrical machine as set forth in claim 2, wherein the hub portion is integral with the cylindrical and interconnecting disk shaped portions.

4. A rotor for a rotating electrical machine as set forth in claim 1, wherein the interconnecting disk shaped portion extends radially inwardly from the cylindrical portion at one side thereof.

7. A rotor for a rotating electrical machine as set forth in claim 1, wherein the cooling openings occupy the major portion of the interconnecting disk shaped portion so that the remaining areas of said interconnecting disk shaped portion comprise spokes.

8. A rotor for a rotating electrical machine as set forth in claim 7, wherein one axial side of the spokes is inclined from one side thereof to the other side.

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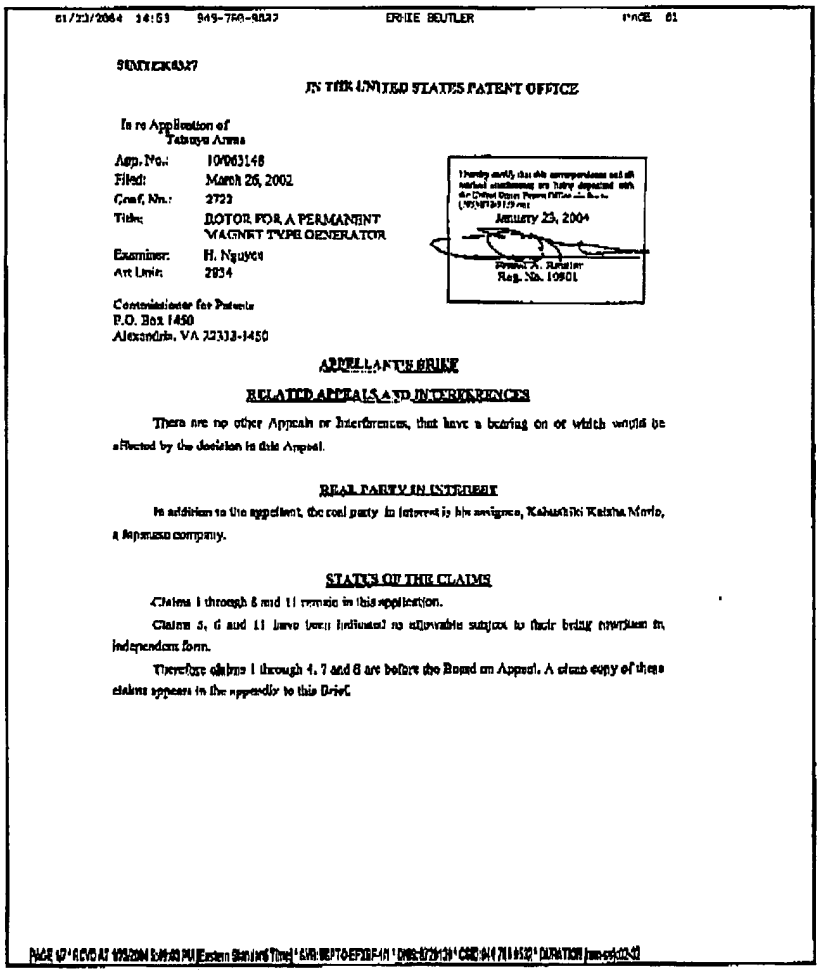

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